Update on HSI Standards, Models & Tools for US Navy Ship Acquisitions

For TTCP Annual Mtg
06JUN00

BCI, Inc.

Programs to Discuss

- ONR/SC-21 S&T MAI
  - SALSA (HCDA)
  - TIDE
  - MMWS
  - HCDE
- SHIPSHAPE
- SEAIT/SMART
- ORGNET
- Human Scriptable Animation
- ICE

SC-21 / ONR Science & Technology Manning Affordability Initiative (MAI)

Trish Hamburger

www.manningaffordability.com

Resource

www.manningaffordability.com

Warfighter

Designer

HUMAN Performance Models and Metrics

Human Performance Models & Metrics

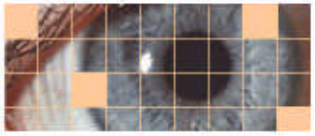
Salsa — Stand ALone Search Agent — Dip into Human Factors

Welcome to SALSA - Microsoft Internet Explorer

File Edit View Favorites Tools Help Send

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss RealGuide

SALSA Stand ALone Search Agent



Glossary Original Sources Help

FIND GUIDE LINES

FIND CASE STUDIES

Find Guidelines

Choose a reference to search:

- ○ Human Factors Design Guide DOT/FAA/CT-96/1
- ○ Design Criteria Standard MIL-STD-1472F
- ○ Situation Awareness Guidelines NAWCADPAX--96-268-TM
- ◉ All

Search By Keyword

Search By Keyword

Search By Human Factors Issue

Choose an issue...

Search By Issue

Find Guidelines | Find Case Studies | Home | Glossary | Original Sources | Help

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Status

- Usability Testing
- Adding Guidelines

- Will be Linked to www.manningaffordability.com

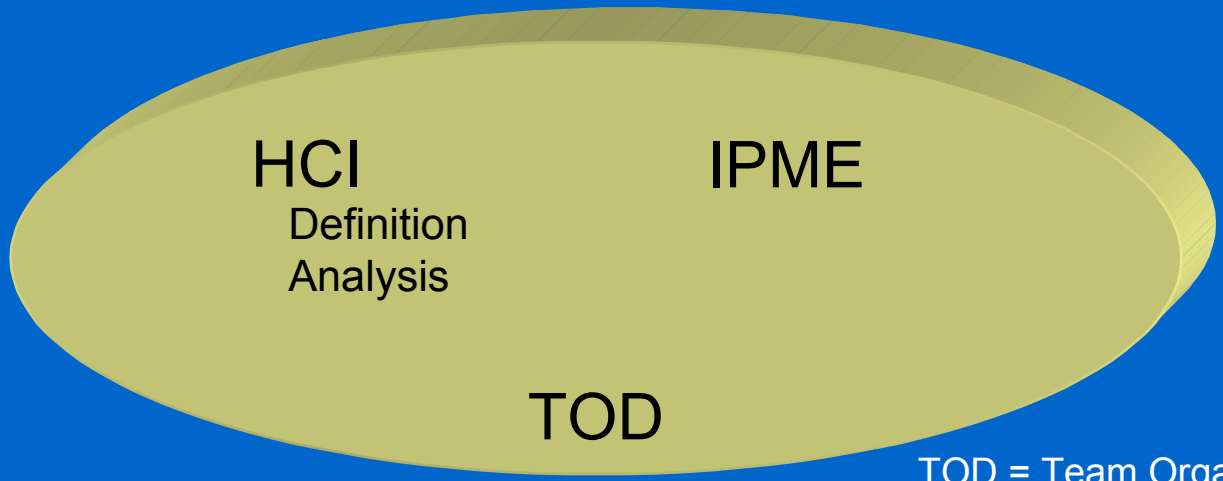
- Will Fold into Engineering Assistant (HCDA - HCDE)

HCDA=Human Centered Design Advisor
HCDE=Human Centered Design Environment

TIDE

Aptima
HUMAN-CENTERED ENGINEERING

Team Integrated Design Environment



TOD = Team Organizational Design
IPME = Integrated Performance Modelling Environment

Aptima, Inc.

TIDE Status

TIDE Evaluation JUL 00

ORGNET/PRO

Small Business Innovative Research Phase II

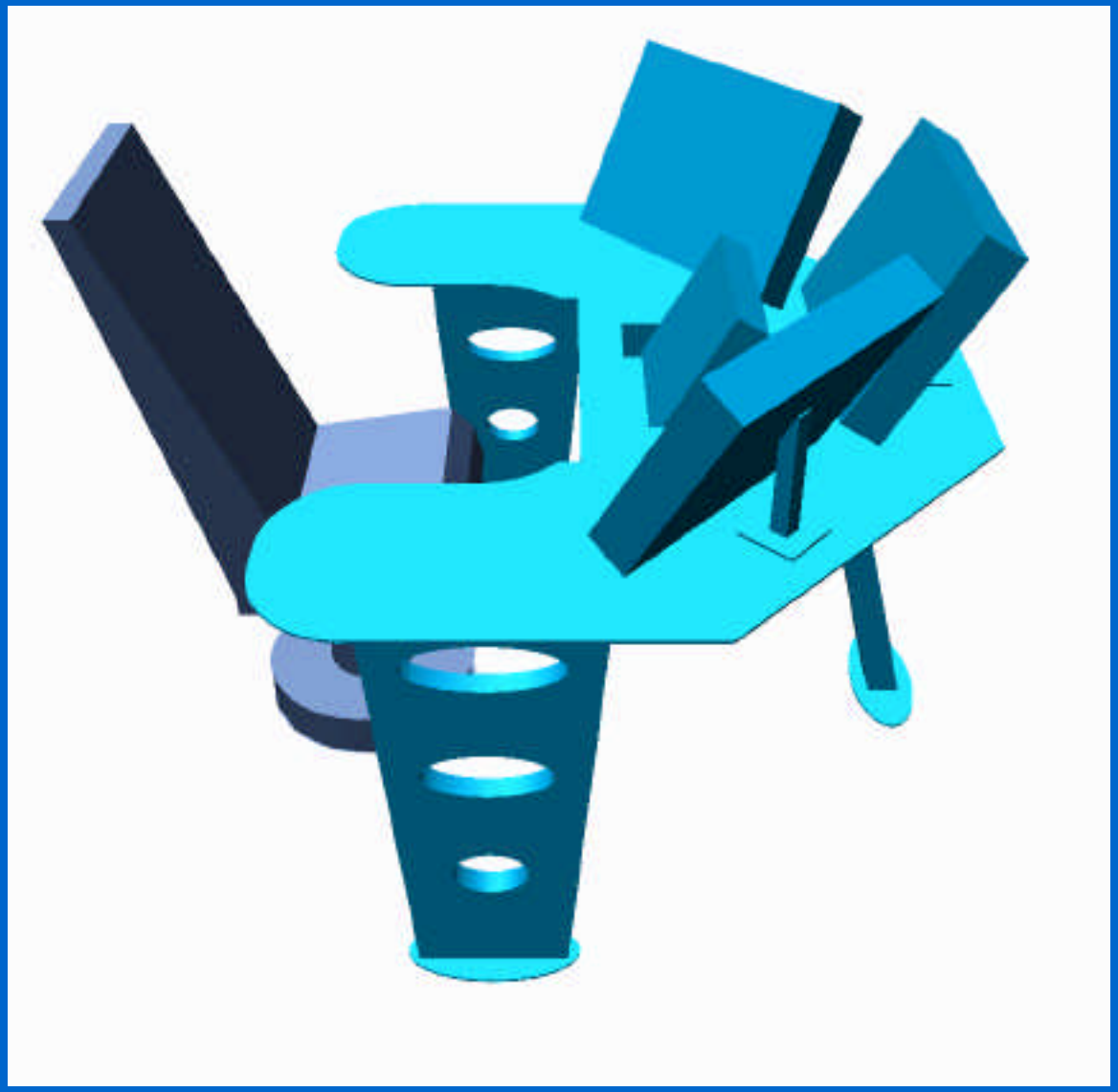
What is ORGNET/PRO?

- Methodology (ORGNET) and toolset (PRO) to aid in designing teams to optimize performance
- Based on simulation of manual, cognitive, and automated processes
- Resulting models can be leveraged for other uses, e.g., training and automation design/implementation

Phase II Year 1 Summary

- Designed and partially implemented detailed process and interface concept
- Designed and implemented data management and storage software, interaction between ORGNET and PRO
- Implemented many aggregate-level measures
- Acquired and tested optimization and clustering software

MMWS 2000



- MMWS is:
  - A *new approach* to task-centered watchstanding,
  - As part of a Total Ship Information Management method,
  - A set of warfighter tools to increase efficiency
  - An active approach to monitoring and adjusting workload in real-time across a warfighter team.

- MMWS is not:
  a 'workstation project' or 'demonstration' of display formats running on futuristic hardware.

DEMONSTRATION/TESTING

Status

- AEGIS Benchmark Testing Complete
- MMWS Team Testing July 00

Human Centered Design Environment (HCDE)

NSWC DD

HCDE...We Want to Build:

Complex, Human-Centric Systems

PROBLEM DESCRIPTION

- Meets Specs
- Good HW/SW Engineering
- Traceable to Requirements

- Failure to Properly Account for Human Operators and Maintainers
- Failure to Design for Flexibility and Future Growth

TWO THRUSTS

- New Engineering Process
  - Treat Human as Integral Part of the System
- Advanced Engineering Environment
  - Develop Human Engineering Tools
  - Integrate Hardware / Software / Human Engineering Disciplines

The Sailor Is Engineered Into the System From the Beginning

Total Systems Engineering

Operational Environment

Regulatory Constraints

Anticipated Obstacles

Control Requirements

Temporal Constraints

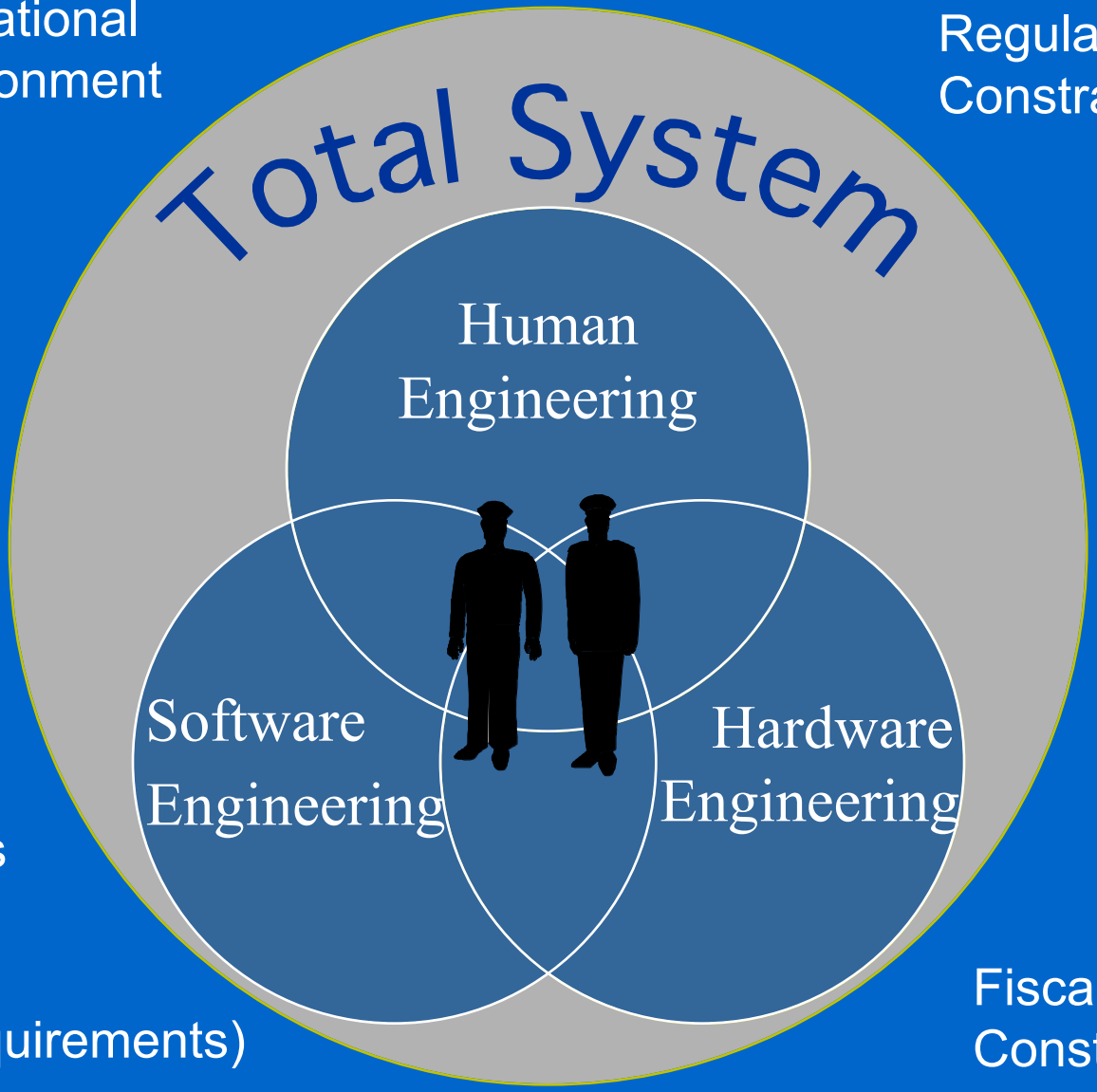
Strength of Materials

External Interfaces

User Community

Purpose (Mission Requirements)

Fiscal Constraints



PROCESS

SYSTEM ENGINEERING PROCESS

HUMAN ENGINEERING PROCESS

IEEE 1220-1998
Application and Management of the Systems Engineering Process

DEC98

WHAT

Ongoing

ISO 15288
Life Cycle Management – System Life Cycle Processes

WHAT

INCOSE SYSTEMS ENGINEERING HANDBOOK

JUL00

HOW

HCDE Process

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In order to avoid this fate, we need to provide the tools and capabilities to support the process

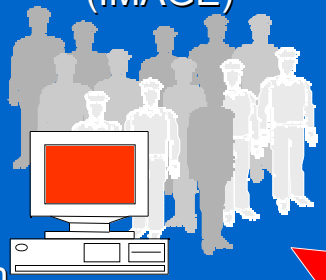
INTEGRATED ENGINEERING ENVIRONMENT

HCDE

COTS or GFE Tools

Developed under S&T Program

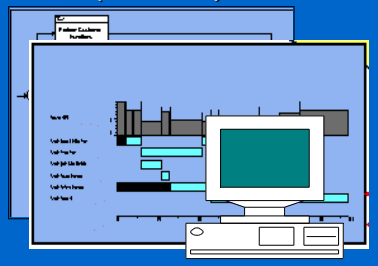
Function Definition (IMAGE)

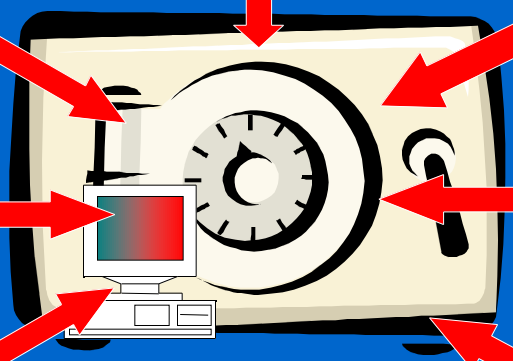


System Requirements Management (DOORS)

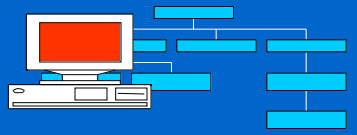
Process Guidance (HCDA)

System Function Analysis (CORE)



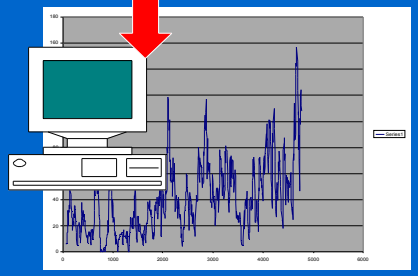


Organizational Design (TIDE)



System Design Integration (Interchange)

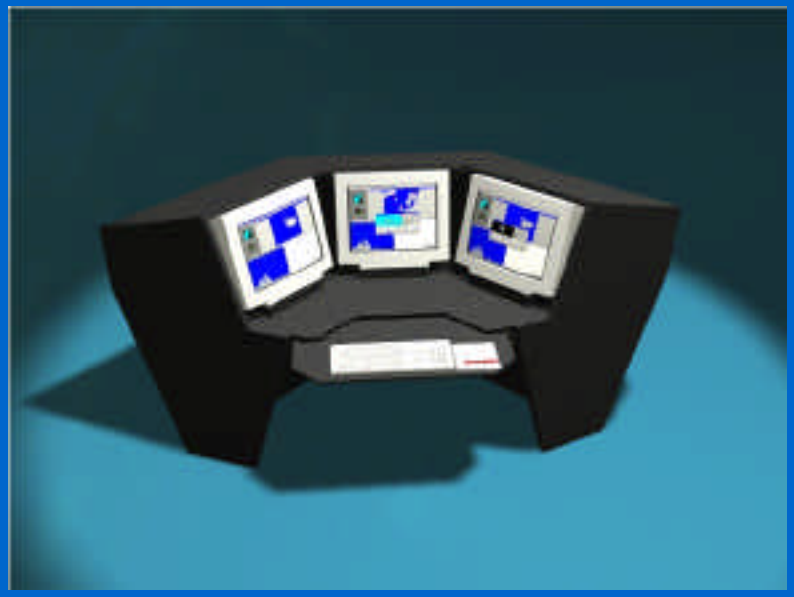
Physical Design Analysis (ENVISION/ERGO)



Human Performance Modeling (IPME)

Cost Analysis (COMET/VAMOSC)

Interchange R & D Efforts



- Advanced Design Station
  - Voice Enabled (Via Voice)
    - Voice Object Query Language
  - Touch Screen
  - Multiple Displays
- New Plugin Technology
  - JINI
  - XML
  - Monarch

HCDE Transition

Interchange

- Beta Testing
- Motorola

HCDE

- Collaborative Engineering Environment
  - For USNRDA CHENG (RADM Paige)
- Land Attack Warfare IPT
  - Function Analysis
- Supporting Arms Coordination Center Redesign